Part III: Quantifying Soil Disturbance

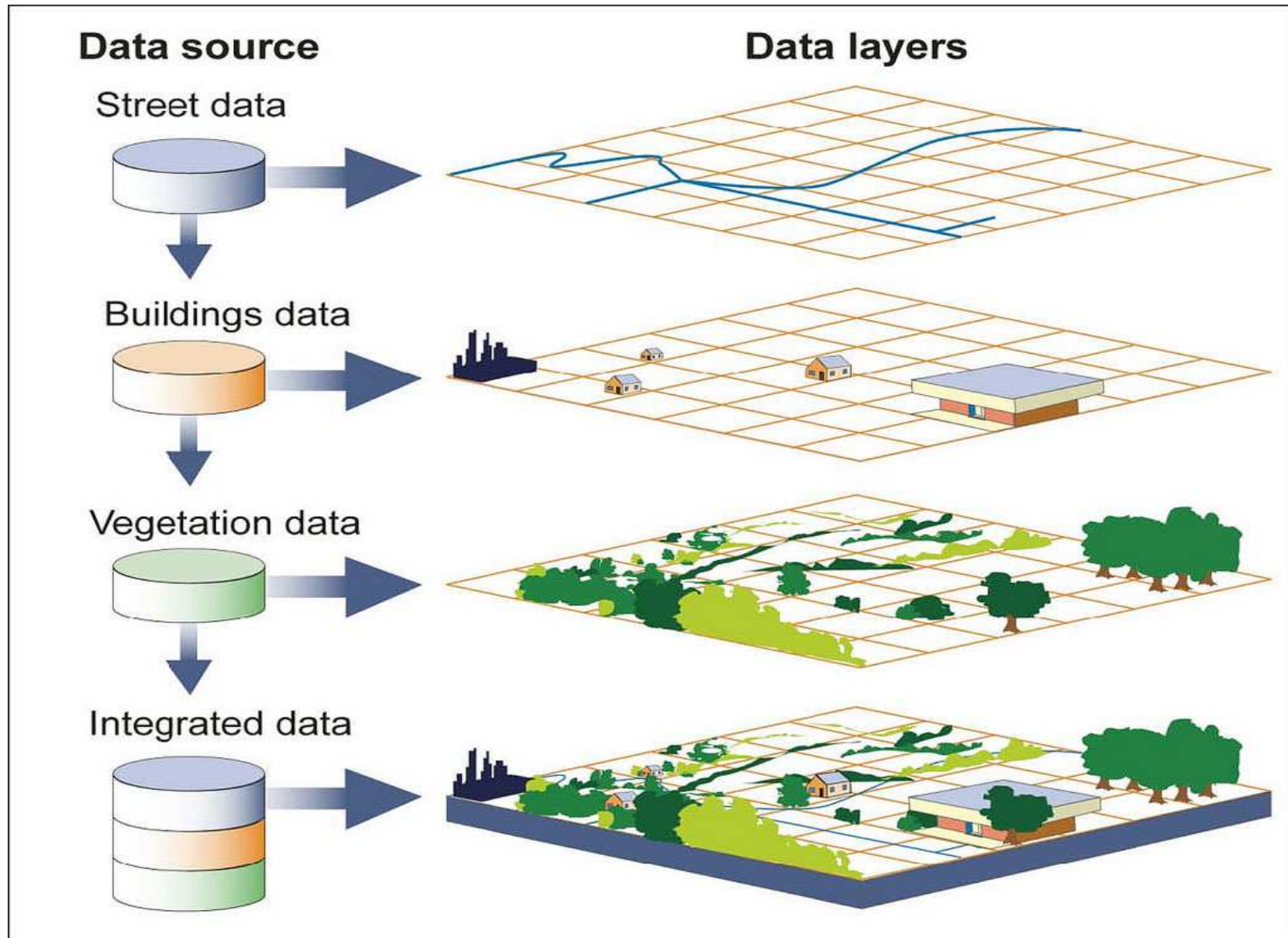# Part III: Quantifying Soil Disturbance

Step 1 - **Contract with Rowan University GEOLAB to Measure Land Uses on Preserved and Unpreserved Farms Through Use of Geographic Information Systems (GIS)**

What Are Geographic Information Systems (GIS)?

Source: GAO.

Rowan GIS Database Design of Land Use Classifications

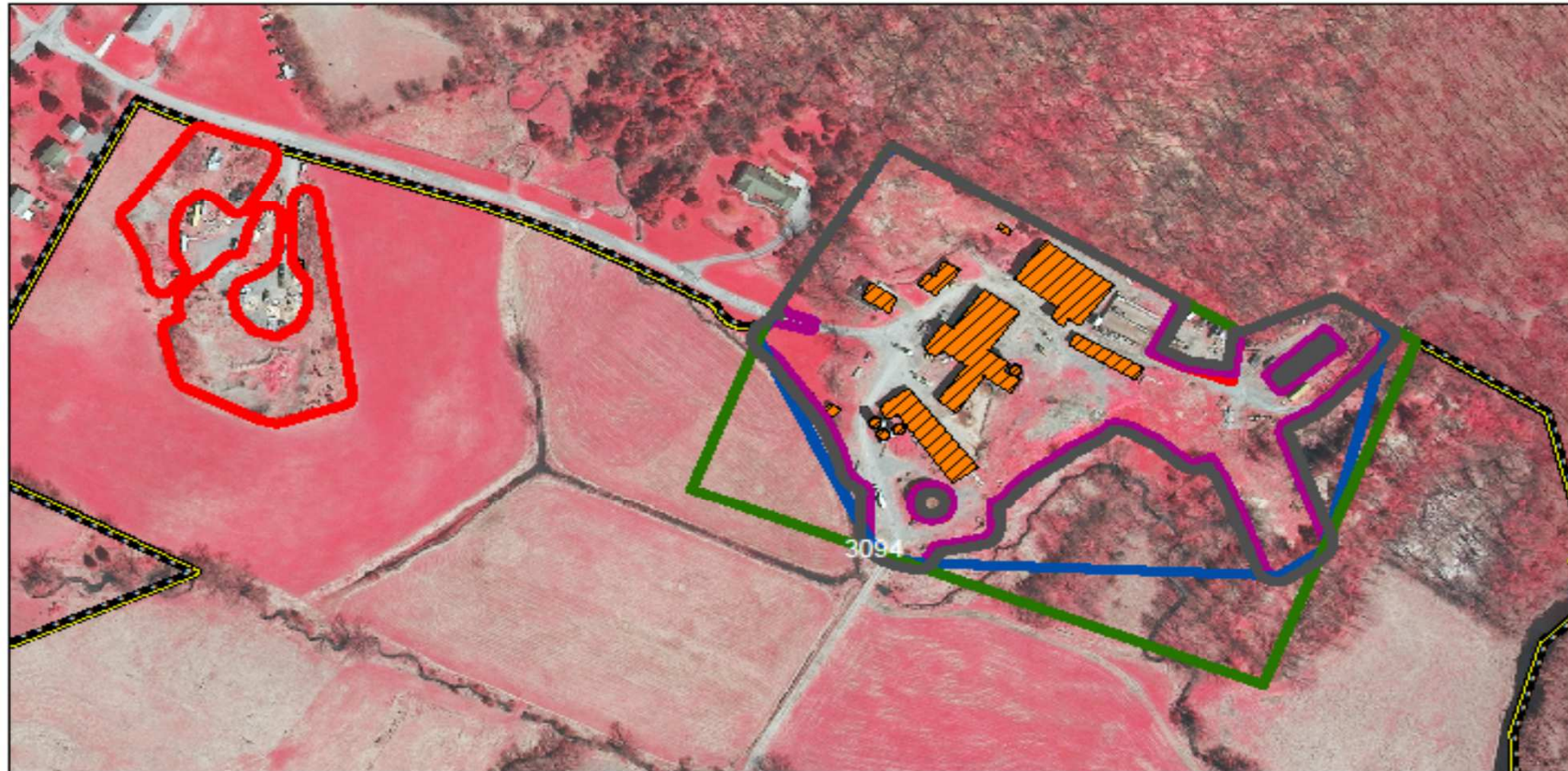| ENUM	CODE	DESCRIPTION	LAND USE TYPE
1	UNKNOWN	Not null, reviewed and still unsure	Unknown
2	FARMYARD	"Other" agriculture - pasture, etc.	Natural Resources
3	BUILDING	Houses, barns, greenhouses, farm markets	Permanent Disturbance
4	SILO	Silos	Permanent Disturbance
5	TOWER	Cell, electrical, wind turbine	Permanent Disturbance
6	PIT	Other permanent depression	Permanent Disturbance
7	PARKING - PAVED	Areas where vehicles stop; paved/surfaced	Permanent Disturbance
8	PARKING - UNPAVED	Areas where vehicles stop; unpaved/unsurfaced but compacted	Permanent Disturbance
9	FARMLANE - PAVED	Areas where vehicles travel; paved/surfaced	Permanent Disturbance
10	FARMLANE - UNPAVED	Areas where vehicles travel; unpaved/unsurfaced	Temporary Disturbance
11	HOOPHOUSE	Semi-permanent structures	Temporary Disturbance
12	WEED FABRIC	Rows of dark fabric/plastic in a field	Temporary Disturbance
13	SOLAR PANELS	Area of solar panels, not an assumption on the foundation/supports	Temporary Disturbance
14	HARDSCAPE	Patios, basketball/tennis courts	Permanent Disturbance
15	EQUINE TRACK/ARENA	Horse tracks and arenas; check infield for ponds	Permanent Disturbance
16	POOL	Swimming pools or ornamental ponds	Permanent Disturbance
17	MAN MADE POND	Man-made water surface area	Permanent Disturbance
18	STORM BASIN	Man made, intermittent water	Permanent Disturbance
19	NATURAL WATER	Natural Water	Natural Resources
20	AGRICULTURAL PRODUCTION	Agricultural Production	Natural Resources
21	WOODLAND	Woodlands	Natural Resources
22	WETLANDS	Non-Agricultural Wetlands (from DEP Land Use/Land Cover)	Natural Resources
23	BARREN	Barren, impacted lands not part of the farmyard	Natural Resources

Rowan GIS Mapping of Land Use Classifications

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Legend

Disturbance Type

- Permanent Disturbance
- Temporary Disturbance
- Natural Resources

N

| 0 | 500 | 1,000 | 2,000 |

Feet
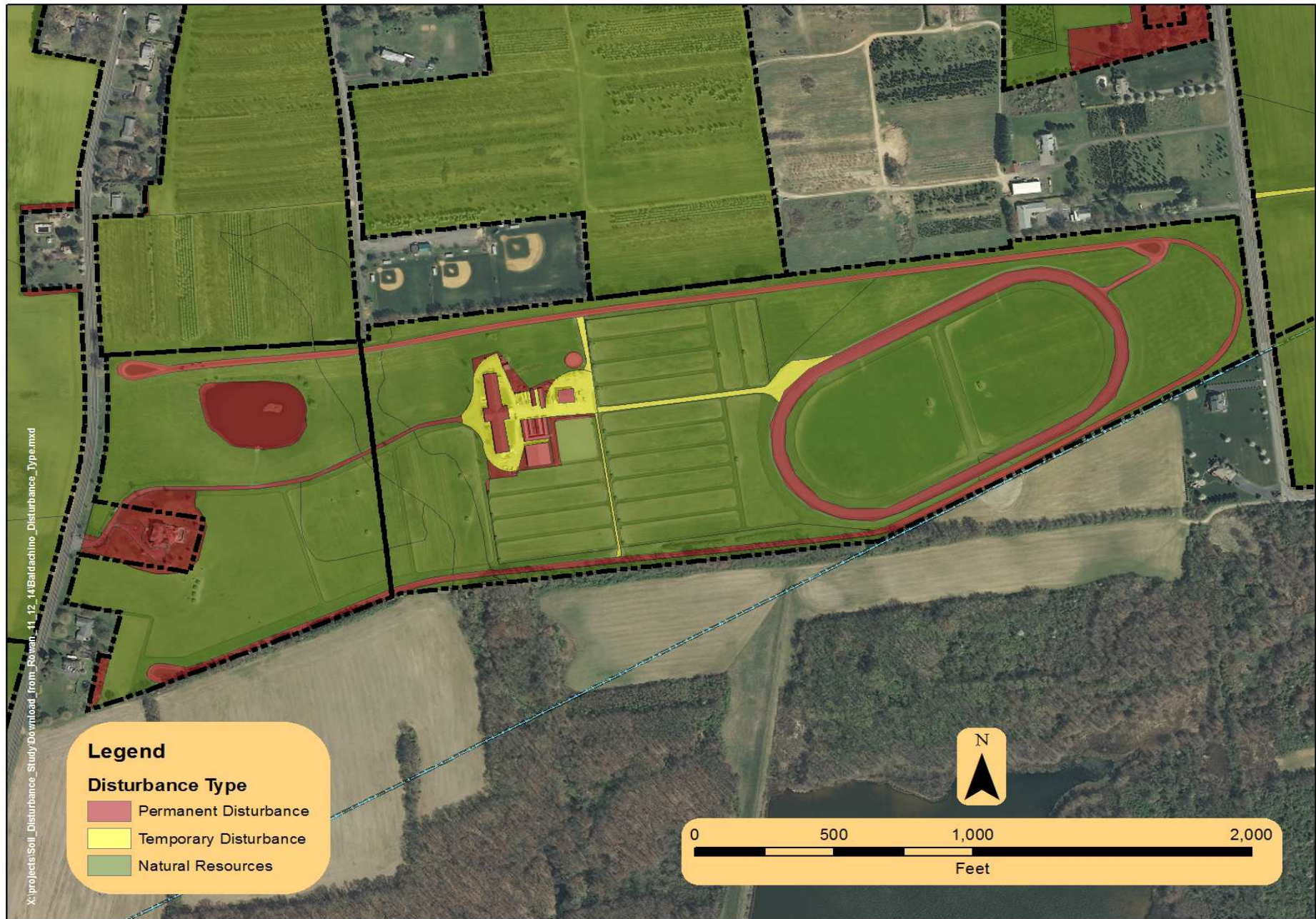
Rowan GEOLAB - Individual vs. Collective Disturbances

- Core Complex - Bounded with Rectangle (MBR)
- Core Complex - Bounded with Convex Hull
- Core Complex - With ~10 % Buffer
- Core Complex - No Bounding
- Base Model
- Hard_Disturbance_No_Farmyard

Rowan GEOLAB Soil Disturbance Results

Phase I - 100% of Preserved Farms Measured (2,198 Farms)

Phase II - Statistically Valid Random Sample of Unpreserved Farms Measured; Farms with > Median Farmland Assessment Value Targeted (654 Farms)

Total - 2,852 Farms, 224,289 Acres Measured (31.4% of all farms and farm acreage in NJ)

*90% of Farms Have Permanent Disturbance

Part III: Quantifying Soil Disturbance

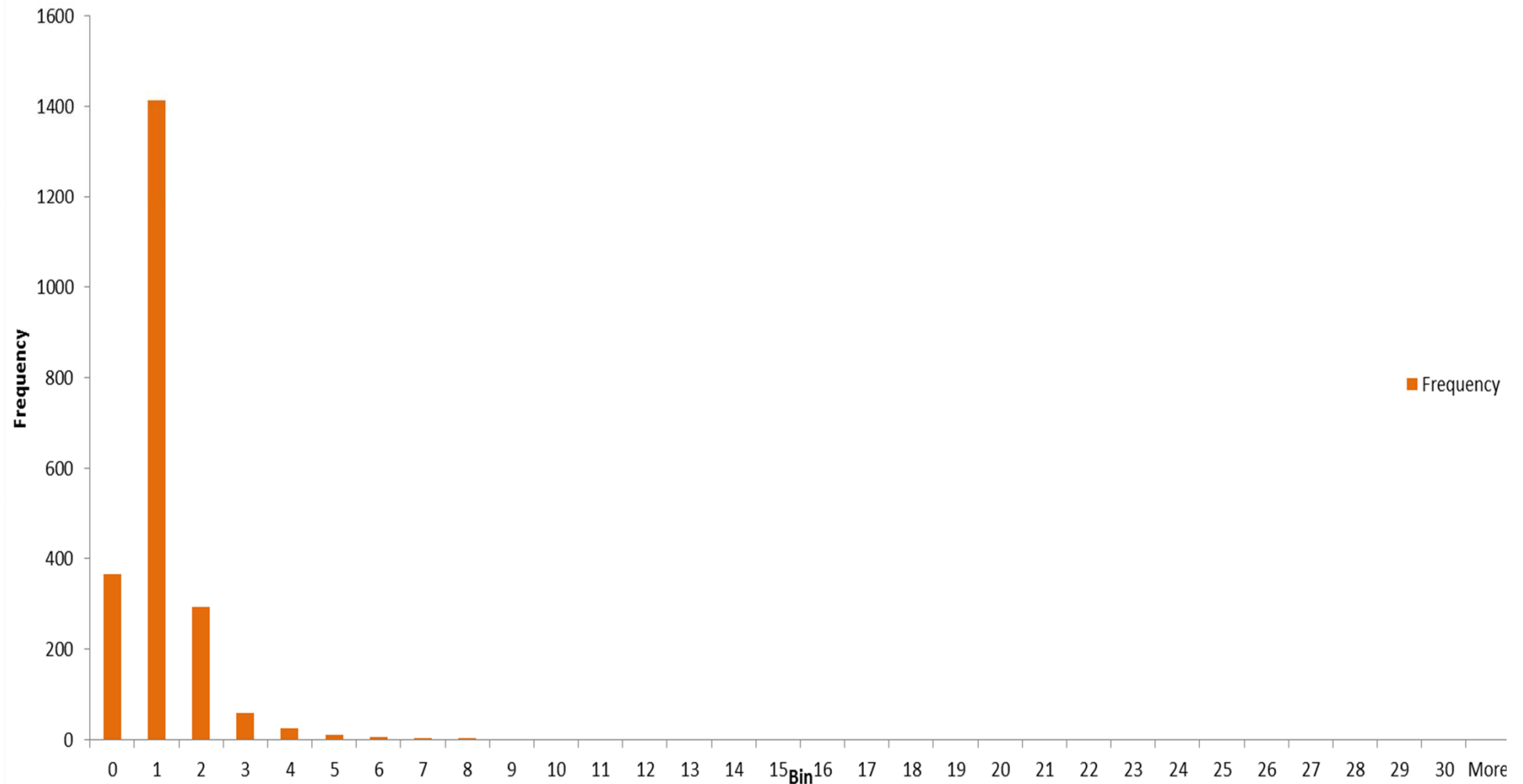## Step 2 - Aggregate Permanent Disturbance Numbers and Compare Results of Both Phases of Rowan's Study

Frequency of Rowan Disturbance Acreage on Preserved Farms
(1,414 Farms -- 64% of Total -- Have 1 Acre of Disturbance; 97% of Farms Have 0 - 3 Acres, 99% of Farms Have 0 - 6 Acres)

Histogram

Rowan Disturbance Averages/Percentages
(For Farms with Permanent Disturbance)

Farm Size	PRESERVED FARMS Avg. Dist. Acreage/% of Farm Disturbed	UNPRESERVED FARMS Avg. Dist. Acreage/% of Farm Disturbed
5-25 Acres	0.47 Acres (2.78%)	0.40 Acres (3.47%)
26-50 Acres	0.76 Acres (2.03%)	0.69 Acres (1.94%)
51-75 Acres	0.90 Acres (1.45%)	1.03 Acres (1.69%)
76-200 Acres	1.37 Acres (1.15%)	1.50 Acres (1.30%)
200+ Acres	4.84 Acres (1.52%)	6.88 Acres (1.80%)
All	1.34 Acres (1.40%)	0.69 Acres (2.07%)